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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,613	10/16/2001	Paul L. Sinclair	9792	5753

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EXAMINER
BLACK, LINH

ART UNIT	PAPER NUMBER
2163	

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/981,613	SINCLAIR ET AL.	
	Examiner	Art Unit	
	LINH BLACK	2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,9-11,13 and 14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7, 9-11, 13-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This communication is in response to the Applicants' Response dated 4/18/06. Claims 7, 9-11, 13-14 are pending in the application. Claims 1, 9, 11, 13-14 are independent claims.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Regarding claims 7, 9-11, 13-14, these claims recite a plurality of storage facilities and row ID, but fails to recite a tangible result, a requirement for compliance with the provisions of 35 U.S.C. § 101 in view of the Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, published on 26 October 2005, which can be found at <http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf>, particularly with respect to ANNEX IV Computer-Related Nonstatutory Subject Matter, beginning on page 50.

For a result to be tangible, it must be more than just a thought or a computation; it must have real-world value rather than an abstract result.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7, 9-11, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kruglikov et al. (US 6105026), and further in view of Tow et al. (US 5860070).

As per independent claim 7, Kruglikov et al. teach:

a partition database system comprising: a plurality of storage facilities, each storage facility including data representing a plurality of table rows - fig. 1, elements 110-130 (partitions/segments of table rows of a table); col. 1, lines 1-64 (...the different partitions may reside on physically separate disk drives in the database system – col. 1, lines 62-64). Thus, each disk drive can store at least a partition or table rows. Kruglikov et al. do not teach a row ID which comprises a first, second, and third value, but based on the definitions of these row ID values, Kruglikov et al. teach

- the first value based on ONE or more columns of the table, and is predominate in determining the order of the rows in the storage facilities – fig. 1, Hiredate, the partitioning key 102.
- the second value based on ONE or more columns of the table, and determines the order of those rows with identical first values – fig. 1, columns LAST NAME and FIRST NAME meet the definition of the second value, if HIRE DATE values are the same in a partition, names can be used to further determine the orders of those rows with indentical HIRE DATE values.
- the third value is a uniqueness number that differentiates rows having equal first and second values – fig. 1, ID#.

Kruglikov et al. do not explicitly show: rows ID comprises the three values. However, rows with identical first values and multi-columns keys are not novel in the prior art.

Tow et al. teach "method and apparatus of enforcing uniqueness of a key value for a row a data table" – the title. Tow et al. teach: "The term "value" is used to refer to the contents of row-column, whether numerals, characters, symbols, dates, raw byte strings, etc., or any combination thereof" – col. 2, lines 38-40; "In some databases, mutiple columns are

used as keys. In table 210 of FIG. 2, for example, it might be possible for the CUSTOMER NUMBER value to be the same for two different rows, but for the combination of the CUSTOMER number value and the CUSTOMER NAME value to be unique in each row. This is illustrated more generally by table 410 of FIG. 4, in which a key value in any given row of the table spans more than one column." - col. 2, lines 32-56.

Tow et al. also teach: "row ID comprises a first value based on one or more columns of the table and a second value based on one or more columns of the table" - fig. 4, table 410 with a unique key spans all N columns thus, it meets the limitation: "a first value based on one or more columns of a table and a second value based on one or more columns of the table"; col. 4, lines 57-62; col. 5, lines 10-16. Therefore, if the values of the customer number and customer name are the same for any two different rows, adding a third column to the key column will be needed in order to make the customer table key unique. The third value helps differentiate the rows having equal first and second values. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Kruglikov et al.'s teaching with Tow et al.'s teaching of multi-column key in order to efficiently enforce the row uniqueness for each table partition or storage facility.

As per claims 9-11, Kruglikov et al. teach:

a partition database system comprising: a plurality of storage facilities, each storage facility including data representing a plurality of table rows - fig. 1, elements 110-130 (partitions/segments of table rows of a table); col. 1, lines 1-64 (...the different partitions may reside on physically separate disk drives in the database system – col. 1, lines 62-64). Thus, each disk drive can store at least a partition or table rows. Kruglikov et al. do not teach a row ID which comprises a first and a second value, but based on the definitions of these row ID values, Kruglikov et al. teach

- the first value based on ONE or more columns of the table, and is predominate in determining the order of the rows in the storage facilities – fig. 1, Hiredate, the partitioning key 102 wherein the first value of the row ID corresponds to ranges of values of dates in the column HIRE DATE.
- the second value based on ONE or more columns of the table, and determines the order of those rows with identical first values – fig. 1, columns LAST NAME and FIRST NAME meet the definition of the second value, if HIRE DATE values are the same in a partition, names can be used to further determine the orders of those rows with indentical HIRE DATE values.

Tow et al. teach "method and apparatus of enforcing uniqueness of a key value for a row a data table" – the title. Tow et al. (USP 5860070) teach: "The term "value" is used to refer to the contents of row-column, whether numerals, characters, symbols, dates, raw byte strings, etc., or any combination thereof" – col. 2, lines 38-40; "In some databases, mutiple columns are used as keys. In table 210 of FIG. 2, for example, it might be possible for the CUSTOMER NUMBER value to be the same for two different rows, but for the combination of the CUSTOMER number value and the CUSTOMER NAME value to be unique in each row. This is illustrated more generally by table 410 of FIG. 4, in which a key value in any given row of the table spans more than one column." - col. 2, lines 32-56.

Tow et al. also teach: "row ID comprises a first value based on one or more columns of the table and a second value based on one or more columns of the table" - fig. 4, table 410 with a unique key spans all N columns thus, it meets the limitation: "a first value based on one or more columns of a table and a second value based on one or more columns of the table"; col. 4, lines 57-62; col. 5, lines 10-16. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Kruglikov et al.'s teaching with Tow et al.'s teaching of multi-column key, and to incorporate ranges of dates in multi-column key in order to efficiently

enforce the rows' uniqueness for each table partition or storage facility based on any type of information needed such as dates.

As per independent claim 13, Kruglikov et al. teach:

a partition database system comprising: a plurality of storage facilities, each storage facility including data representing a plurality of table rows - fig. 1, elements 110-130 (partitions/segments of table rows of a table); col. 1, lines 1-64 (...the different partitions may reside on physically separate disk drives in the database system – col. 1, lines 62-64). Thus, each disk drive can store at least a partition or table rows. Kruglikov et al. do not teach a row ID which comprises a first and a second value, but based on the definitions of these row ID values, Kruglikov et al. teach

- the first value based on ONE or more columns of the table, and is predominate in determining the order of the rows in the storage facilities – fig. 1, Hiredate, the partitioning key 102 wherein the first value of the row ID corresponds to ranges of values of dates in the column HIRE DATE.
- the second value based on ONE or more columns of the table, and determines the order of those rows with identical first values – fig. 1, columns LAST NAME and FIRST NAME meet the definition of the

second value, if HIRE DATE values are the same in a partition, names can be used to further determine the orders of those rows with indentical HIRE DATE values. However, Kruglikov et al. do not teach the second value is the result of applying a hash function to a value in at least one specified column.

Tow et al. teach "method and apparatus of enforcing uniqueness of a key value for a row a data table" – the title. Tow et al. (USP 5860070) teach: "The term "value" is used to refer to the contents of row-column, whether numerals, characters, symbols, dates, raw byte strings, etc., or any combination thereof" – col. 2, lines 38-40; "In some databases, mutiple columns are used as keys. In table 210 of FIG. 2, for example, it might be possible for the CUSTOMER NUMBER value to be the same for two different rows, but for the combination of the CUSTOMER number value and the CUSTOMER NAME value to be unique in each row. This is illustrated more generally by table 410 of FIG. 4, in which a key value in any given row of the table spans more than one column." - col. 2, lines 32-56.

Tow et al. also teach: "row ID comprises a first value based on one or more columns of the table and a second value based on one or more columns of the table" - fig. 4, table 410 with a unique key spans all N columns thus, it meets the limitation: "a first value based on one or more columns of a table and a second value based on one or more

columns of the table"; col. 4, lines 57-62; col. 5, lines 10-16. Tow et al. also teach "the proposed key value is mapped into a target value (in a set of target values). The set of target values may be a set of hash values. Hasing and hash values are well known concepts in the art" – col. 4, last paragraph. Tow et al. teach applying a hash function to a value in at least one specified column – col. 3, lines 30-59, col. 4, last paragraph to col. 5, line 28; col. 6, lines 17-27; col. 7, lines 18-57. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Kruglikov et al.'s teaching with Tow et al.'s teaching of multi-column key, and to incorporate ranges of dates in multi-column key in order to efficiently enforce the rows' uniqueness for each table partition or storage facility based on any type of information needed such as dates. In addition, applying of a hash function to column(s) value(s) would provide several advantages – Tow et al. , col. 7, lines 28-57.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kruglikov et al. (US 6105026), Tow et al. (US 5860070), and further in view of Fujiwara et al. (US5515531).

As per independent claim 14, Kruglikov et al. teach:

a partition database system comprising: a plurality of storage facilities, each storage facility including data representing a plurality of table rows - fig. 1, elements 110-130 (partitions/segments of table rows of a table); col. 1, lines 1-64 (...the different partitions may reside on physically separate disk

drives in the database system - col. 1, lines 62-64). Thus, each disk drive can store at least a partition or table rows. Kruglikov et al. do not teach a row ID which comprises a first and a second value, but based on the definitions of these row ID values, Kruglikov et al. teach

- the first value based on ONE or more columns of the table, and is predominate in determining the order of the rows in the storage facilities - fig. 1, Hiredate.
- the second value based on ONE or more columns of the table, and determines the order of those rows with identical first values - fig. 1, columns LAST NAME and FIRST NAME, or ID# would meet the definition of the second value, if HIRE DATE values are the same in a partition, names or ID# values can be used to further determine the orders of those rows with indentical HIRE DATE values.

Tow et al. teach "method and apparatus of enforcing uniqueness of a key value for a row a data table" - the title. Tow et al. (USP 5860070) teach: "The term "value" is used to refer to the contents of row-column, whether numerals, characters, symbols, dates, raw byte strings, etc., or any combination thereof" - col. 2, lines 38-40; "In some databases, mutiple columns are used as keys. In table 210 of FIG. 2, for example, it might be possible for the CUSTOMER NUMBER value to be the same for two different rows, but for the combination of the CUSTOMER number value and the

CUSTOMER NAME value to be unique in each row. This is illustrated more generally by table 410 of FIG. 4, in which a key value in any given row of the table spans more than one column." - col. 2, lines 32-56.

Tow et al. also teach: "row ID comprises a first value based on one or more columns of the table and a second value based on one or more columns of the table" - fig. 4, table 410 with a unique key spans all N columns thus, it meets the limitation: "a first value based on one or more columns of a table and a second value based on one or more columns of the table"; col. 4, lines 57-62; col. 5, lines 10-16. Tow et al. also teach "the proposed key value is mapped into a target value (in a set of target values). The set of target values may be a set of hash values. Hasing and hash values are well known concepts in the art" – col. 4, last paragraph. Tow et al. teach applying a hash function to a value in at least one specified column – col. 3, lines 30-59, col. 4, last paragraph to col. 5, line 28; col. 6, lines 17-27; col. 7, lines 18-57. However, both Kruglikov et al. and Tow et al. do not explicitly suggest do not teach the table rows are distributed among the plurality of storage facilities based on the second value.

Fujiwara et al. teach database partitioning using hash table or function with primary partition key and secondary partition key – col. 6, lines 20-49; when the hash function is applied to partition a database, table rows would be distributed among the partitions based on the hash values or partitioning key(s) – col. 7, lines 10-67; col. 9, lines 47 to col. 10, line 26. Thus, it would have been obvious to one of ordinary skill in

the art at the time of the invention to combine Kruglikov et al.'s teaching with Tow et al.'s teaching of multi-column key, and to incorporate hash function(s)/table(s) to column(s)' value(s) would provide several advantages – Tow et al. , col. 7, lines 28-57.

Response to Arguments

Applicant's arguments filed 4/18/06 have been fully considered but they are not persuasive.

Regarding claims 7, 9-10 and 11, Kruglikov et al. and Tow et al.'s teachings do meet limitations cited in the claims' language. Please see the citings above.

Regarding claims 13-14, Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Kawamura (US 6578039) teaches database partitioning using hash function – col. 3, lines 24-37; col. 4, lines 44-65; col. 7, lines 33-49.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LINH BLACK whose telephone number is 571-272-4106. The examiner can normally be reached on 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LINH BLACK
Examiner
Art Unit 2163

July 7, 2006

DON WONG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100